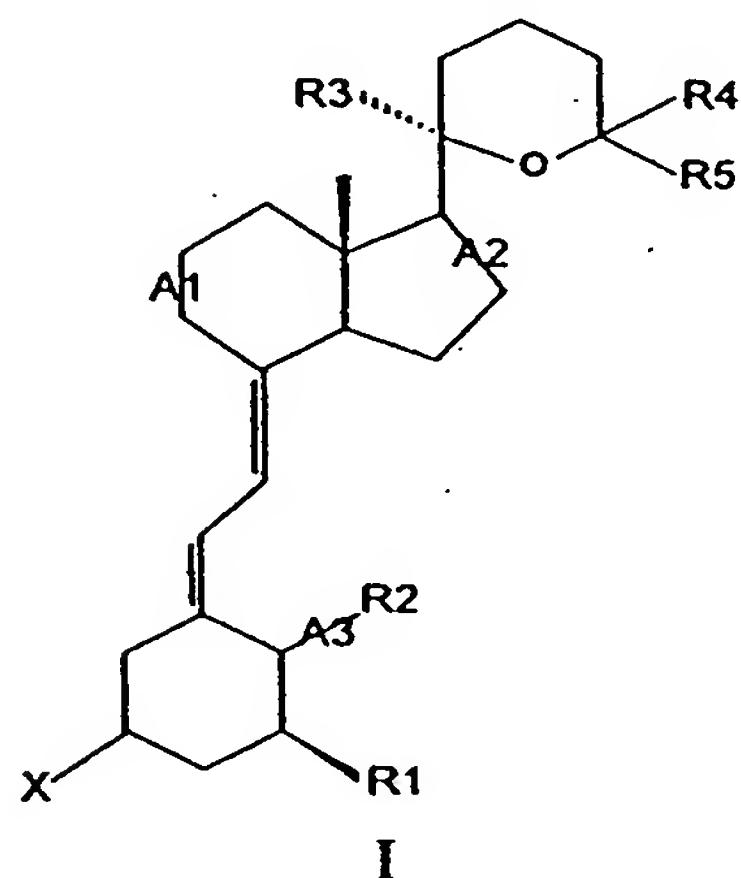


What is claimed is:

1. An isolated cyclic ether vitamin D₃ compound having the formula (I) as follows:

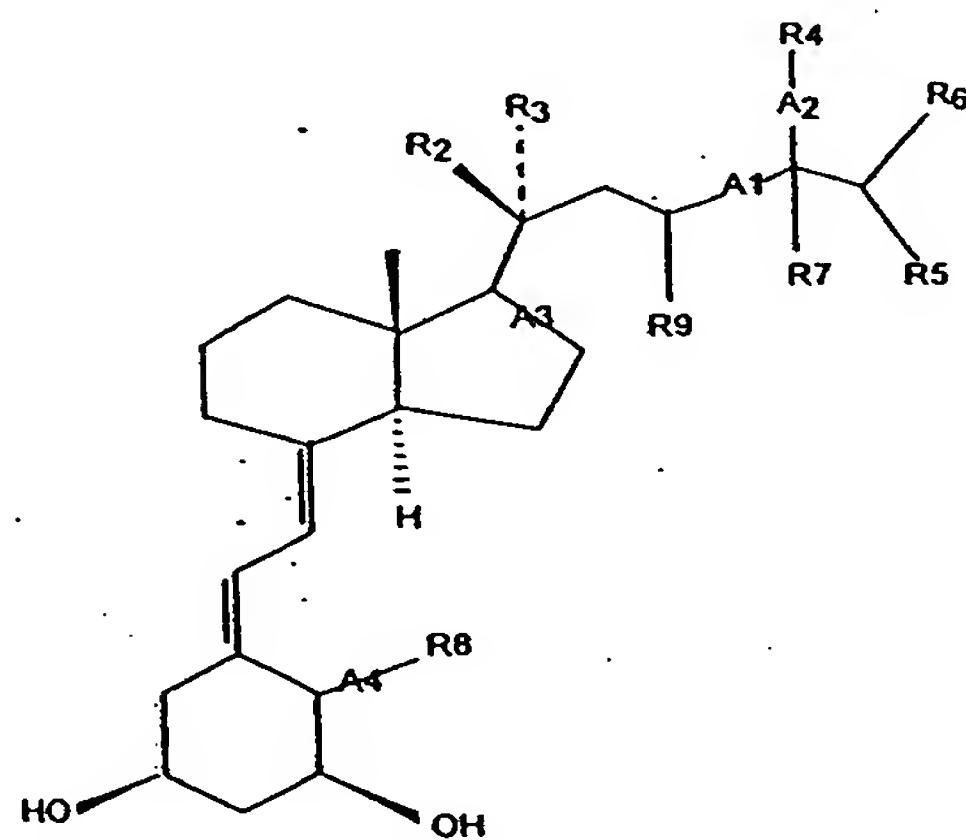


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, wherein A₁, A₂ and A₃ are a single or a double bond; X, R₁, R₂, R₃, R₄ and R₅ are selected from the group consisting of a hydrogen, a halogen, a haloalkyl, a hydroxy, a hydroxy-protecting group, an alkyl, an alkenyl, an alkynyl, an alkoxy, an aryl group and a heterocyclic group.

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2. An isolated 3-epi form of 1 α -hydroxy-vitamin D₃ compounds having the formula II as follows:



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, wherein A₁ is a single, a double, or a triple bond; A₂, A₃ and A₄ are each independently selected from the group consisting of a single or a double bond; R₂, R₃, R₄, R₇, R₈ and R₉ are independently selected from the group consisting of a hydrogen, a deuterium, a deuteroalkyl, a hydroxy, an alkyl, an alkoxide, an O-acyl, a halogen, a haloalkyl, a hydroxyalkyl, an amine or a thiol group, and wherein the pairs of R₂ and R₃, and R₄ and R₇ taken together are an oxygen atom; and R₅ and R₆ are independently

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selected from the group consisting of a hydrogen, a deuterium, a halogen, an alkyl, a hydroxyalkyl, a haloalkyl, and a deuteroalkyl.

3. The compound of claim 2, which is 1α (OH) vitamin D₃, $1\alpha,24$ dihydroxy 3-epi
5 vitamin D₃, 1α hydroxy 24-ethyl 3-epi vitamin D₃, 1α hydroxy 24-methyl 3-epi vitamin
D₃, or $1\alpha,24$ -dihydroxy 24-methyl 3-epi vitamin D₃.

4. A method of treating a disorder characterized by an aberrant activity of a vitamin
D₃-responsive cell, comprising administering to a subject an effective amount of a
10 vitamin D₃ compound having the formula (I) or (II) of any of claims 1 or 2, such that the
aberrant activity of the vitamin D₃-responsive cell is reduced.

15 5. The method of claim 4, wherein the disorder comprises an aberrant activity of a
hyperproliferative skin cell.

6. The method of claim 4, wherein the disorder comprises an aberrant activity of an
endocrine cell.

20 7. The method of claim 6, wherein the endocrine cell is a parathyroid cell and the
aberrant activity is processing and/or secretion of parathyroid hormone.

8. The method of claim 7, wherein the disorder is secondary hyperparathyroidism.

25 9. The method of claim 8, wherein the disorder comprises an aberrant activity of a
bone cell.

30 10. The method of claim 9, wherein the disorder is selected from the group
consisting of osteoporosis, osteodystrophy, senile osteoporosis, osteomalacia, rickets,
osteitis fibrosa cystica, renal osteodystrophy, secondary hyperparathyroidism, cirrhosis,
and chronic renal disease.

11. The method of claim 4, wherein the subject is a mammal.

35 12. The method of claim 11, wherein the mammal is a human.

13. A method of ameliorating a deregulation of calcium and phosphate metabolism,
comprising administering to a subject a therapeutically effective amount of a 3-epi
vitamin D₃ compound of any of claims 2 or 3, so as to ameliorate the deregulation of the
calcium and phosphate metabolism.

40 14. The method of claim 13, wherein the deregulation of the calcium and phosphate
metabolism leads to osteoporosis.

45 15. A pharmaceutical composition comprising, a therapeutically effective amount of a
vitamin D₃ compound of any of claims 1 or 2, and a pharmaceutically acceptable carrier.

16. The composition of claim 15, which is suitable for topical or oral administration.
17. A packaged compound, comprising a vitamin D₃ compound of any of claims 1 or 2, packaged with instructions for use of the compound for treating a disorder characterized by an aberrant activity of a vitamin D₃-responsive cell.
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